



PATENT APPLICATION

PATENT AND TRADEMARK OFFICE

BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of

On Appeal from Group: 1722

Shinpei OONO et al.

Application No.: 09/865,589

Examiner: D. HECKENBERG

Filed: May 29, 2001

Docket No.: 123724

For: APPARATUS FOR FORMING PATTERN ONTO ARTICLE DURING INJECTION
MOLDING

APPEAL BRIEF TRANSMITTAL

Commissioner for Patents
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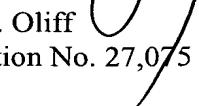
Attached hereto is our Brief on Appeal in the above-identified application.

Also attached hereto is our Check No. 176225 in the amount of Five Hundred Dollars (\$500.00) in payment of the Brief fee under 37 C.F.R. 41.20((b)(2)). In the event of any underpayment or overpayment, please debit or credit our Deposit Account No. 15-0461 as needed in order to effect proper filing of this Brief.

For the convenience of the Finance Division, two additional copies of this transmittal letter are attached.

Respectfully submitted,


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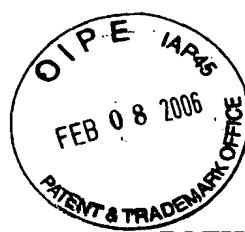

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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND INTERFERENCES

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BRIEF ON APPEAL

Appeal from Group 1722

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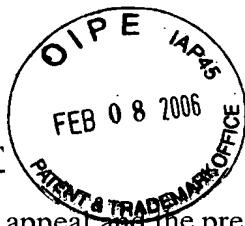
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APPENDIX - CLAIMS APPENDIX

I. REAL PARTY IN INTEREST

The real party in interest for this appeal and the present application is Dai Nippon Printing Co., Ltd, by way of an Assignment recorded in the U.S. Patent and Trademark Office at Reel 7703, Frames 301-304.



II. STATEMENT OF RELATED APPEALS AND INTERFERENCES

There are no prior or pending appeals, interferences or judicial proceedings, known to Appellant, Appellant's representative, or the Assignee, that may be related to, or which will directly affect or be directly affected by or have a bearing upon the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 7 and 8 are on appeal.

Claims 7 and 8 are pending.

Claims 7 and 8 are rejected.

Claims 1-6 and 9 are cancelled.

IV. STATUS OF AMENDMENTS

No Amendment After Final Rejection has been filed.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Claim 7 is directed to an apparatus for forming a pattern onto an article during injection molding of the article. *See* claim 7; instant specification, page 1, lines 6 to 8. The apparatus is advantageous in that it permits a pattern to be formed on an article during injection molding without leaving impressions of a heating board on a molded article. *See* instant specification, page 1, lines 8 to 10.

The apparatus of claim 7 includes feed means for feeding a pattern-bearing film to a molding position where a male mold and a female mold of the apparatus are opposed. *See* claim 7. Exemplary feed means include the feed means shown in FIG. 1 of the instant specification. Such feed means include a roll R supported on a supply and holding device S, around which a pattern-bearing film X is wound, and chuck devices 34, 34 that feed the pattern-bearing film to a position opposed to the female mold 2 of the apparatus. *See* instant specification, page 10, lines 28 to 31; page 12, lines 31 to 33; FIGS. 1 and 7. Alternative feed means may further include a pair of feeding rollers 42, 42 capable of positive and reverse rotation situated downstream of the roll R for advancing and withdrawing the pattern-bearing film X toward or away from the female mold 2. *See* instant specification, page 17, lines 7 to 14; FIG. 15.

The apparatus of claim 7 also includes a heating board formed in a single line only that heats the pattern-bearing film so as to soften it. *See* claim 7. The heating board has a heating surface and is movable into and away from a space between the male mold and the female mold of the apparatus. *See* claim 7. An exemplary heating board is shown in FIG. 2 of the instant specification. The heating board 9 may have a stacked structure including, *inter alia*, a heating plate 10, a liner plate 11, a heater panel 12, and an insulation plate 13. *See* instant specification, page 10, lines 34 to 36; FIG. 2. The heating board 9 functions to heat

the pattern-bearing film X in a non-contact state. *See* instant specification, page 14, line 28 to page 15, line 1.

The apparatus of claim 7 further includes transfer means for transferring the pattern-bearing film to an internal surface of the female mold of the apparatus, so that the pattern-bearing film contacts the internal surface of the female mold. *See* claim 7. Exemplary transfer means include an air exhaust hole 8 provided in the female mold 2 through which air in the female mold 2 is exhausted to the outside. *See* instant specification, page 10, lines 8 to 11; FIG. 1. The female mold 2 may also be provided with a plurality of air suction holes 8a. *See* instant specification, page 17, lines 15 to 20; FIG. 15. Exemplary transfer means may also include air blowing holes 17 provided in the heating board 9. *See* instant specification, page 11, lines 11 to 15; FIG. 2. In operation, after the pattern-bearing film X is softened by the heating board 9, the pattern-bearing film X is drawn toward an internal surface of the female mold 2 by exhausting air through the air exhaust hole 8 (and/or the air suction holes 8a) of the female mold 2 and/or blowing air toward the pattern-bearing film X through the air blowing holes 17 of the heating board 9. *See* instant specification, page 15, lines 1 to 8.

The apparatus of claim 7 also includes closing means for causing the male mold and the female mold of the apparatus having the pattern-bearing film situated therebetween to approach each other to form a closed molding cavity. *See* claim 7. Exemplary closing means include a ram 7 that pushes the female mold 2 toward the male mold 1. *See* instant specification, page 10, lines 5 to 8.

The apparatus of claim 7 further includes a resin injecting device that injects a molten resin into the closed molding cavity to form a molded article to adhere the pattern-bearing film to the surface of the article. *See* claim 7. Molten resin may be injected to a space between the male mold 1 and the female mold 2 through an injection gate 4 in the male mold

1, so as to form a final resin molding that adheres to the pattern-bearing film X. *See* instant specification, page 15, lines 9 to 22; FIGS. 12 and 13.

In the apparatus of claim 7, the heating board is formed in a single line only and is divided into a plurality of heating blocks. *See* claim 7. Each of the heating blocks independently controls heat generated by the heating block. *See* claim 7. Each of the heating blocks has a transverse width sufficient to cover at least most of a width of the pattern-bearing film. *See* claim 7. In the apparatus of claim 7, the heating blocks are arranged in a vertical direction in one line only so that one heating block is disposed adjacently above another heating block. *See* claim 7. An exemplary heating board 9 may include multiple heating blocks 9A, 9B, 9C arranged from an upper surface to a lower surface of the heating board 9. *See* instant specification, page 20, lines 19 to 22; FIGS. 25 and 26. Temperatures of the heating blocks 9A, 9B, 9C may be individually controlled. *See* instant specification, page 20, lines 24 to 28.

In the apparatus of claim 7, the pattern-bearing film is sent from an upper position to a lower position along a vertical direction in one line. *See* claim 7. A direction of arrangement of the divided heating blocks and a direction of passage of the pattern-bearing film are identical. *See* claim 7.

Claim 8 depends from and includes all of the limitations of claim 7. In the apparatus of claim 8, each of the heating blocks includes therein a heating wire and a temperature sensor for detecting a temperature of the respective heating block. *See* claim 8. Temperatures of the heating blocks 9A, 9B, 9C may be individually controlled by electric heating wires 24A, 24B, 24C and temperature sensors 70A, 70B, 70C provided in the heating blocks 9A, 9B, 9C. *See* instant specification, page 20, lines 24 to 28; FIG. 26.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The following grounds of rejection are presented for review:

- 1) Claim 7 is rejected as having been obvious under 35 U.S.C. §103(a) over U.S. Patent No. 5,415,536 to Ohno in view of U.S. Patent No. 5,290,490 to Nied et al.; and
- 2) Claim 8 is rejected as having been obvious under 35 U.S.C. §103(a) over U.S. Patent No. 5,415,536 to Ohno in view of U.S. Patent No. 5,290,490 to Nied et al. and U.S. Patent No. 4,423,669 to Chapman.

VII. ARGUMENT

The Examiner rejects all of pending claims 7 and 8 under 35 U.S.C. §103(a) as being unpatentable over various combinations of U.S. Patent No. 5,415,536 to Ohno ("Ohno")*, U.S. Patent No. 5,290,490 to Nied et al. ("Nied") and U.S. Patent No. 4,423,669 to Chapman ("Chapman"). However, the Examiner has consistently improperly applied the law relating to obviousness. Proper application of the law demonstrates that no *prima facie* case of obviousness has been made, and that the claimed invention would not have been obvious over the applied references.

A. Factual Inquiries to Determine Obviousness/Non-Obviousness

Several basic factual inquiries must be made in order to determine obviousness or non-obviousness of claims of a patent application under 35 U.S.C. §103. These factual inquiries are set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966):

Under §103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or non-obviousness of the subject matter is determined.

The specific factual inquiries set forth in *Graham* have not been considered or properly applied by the Examiner in formulating the rejection of the subject claims. Particularly, the

* Appellants do not admit that Ohno is prior art to the present application. Ohno was published (patented) on May 16, 1995. The present application is entitled to priority benefit of the April 25, 1995 filing date of U.S. Patent Application No. 08/429,218. As the present application has an effective filing date that precedes the publication date of Ohno, Ohno is not available as prior art against the present application under 35 U.S.C. §102(a) or §102(b). Ohno and the present application are commonly owned.

Under 35 U.S.C. §103(c), a reference that is (a) only available as prior art against the claims of a patent application under 35 U.S.C. §102(e), §102(f) or §102(g), and (b) commonly owned with the patent application, can not form the basis of an obviousness rejection. Appellants direct the Board, however, to JP 05-301250, the November 16, 1993 publication of the application to which Ohno claims priority (cited in the May 29, 2001 Information Disclosure Statement).

scope and content of the prior art and the level of ordinary skill in the pertinent art were not properly determined, demonstrated and applied to the claimed invention.

In the present case, proper consideration of the factual inquiries demonstrates the non-obviousness of the claimed invention. The cited references do not teach or suggest an apparatus for forming a pattern onto an article during injection molding of the article including a heating board formed in a single line only and divided into a plurality of heating blocks, the heating blocks each independently controlling heat generated thereby. Nor do the cited references teach or suggest any advantages flowing from incorporation of such a heating board in an apparatus for forming a pattern onto an article during injection molding of the article.

B. Claim 7 Would Not Have Been Rendered Obvious By Ohno In View Of Nied

Claim 7 recites, *inter alia*, "[a]n apparatus for forming a pattern onto an article during an injection molding thereof, comprising ... a heating board formed in a single line only and that heats said pattern-bearing film so as to soften it, said heating board having a heating surface and being movable into and away from a space between said male mold and said female mold ... wherein (1) said heating board is formed in a single line only and is divided into a plurality of heating blocks, each of said blocks independently controlling heat generated by the block and having a transverse width sufficient to cover at least most of the width of said pattern-bearing film, (2) said heating blocks are arranged in a vertical direction in one line only so that one heating block is disposed adjacently above another heating block ... " Ohno and Nied do not teach or suggest such an apparatus.

The Examiner asserts that Ohno discloses an apparatus including feed means, a heating board, transfer means, closing means and a resin injecting device. *See* June 14, 2005

Final Rejection, paragraph 4, pages 3 to 4. The Examiner concedes that Ohno does not disclose a heating board divided into a plurality of independently controlled heating blocks with the blocks being arranged in one line so that one heating block is disposed adjacently above another heating block. *See* June 14, 2005 Final Rejection, paragraph 4, page 4. The Examiner relies on Nied for its alleged teaching of a heater divided into a plurality of individually controlled segments, some of which are aligned in a direction in which a film is processed. *See* June 14, 2005 Final Rejection, paragraph 4, page 4. Although the Examiner admits that the individually controlled segments of the heater of Nied are not arranged in a single line only, he asserts that it would have been obvious to one of ordinary skill in the art modify an apparatus including combined features of Ohno and Nied to include a heater having only a single line of heating blocks. *See* June 14, 2005 Final Rejection, paragraph 4, pages 5 to 6.

At the outset, Appellants note that it is undisputed that neither Ohno nor Nied discloses an apparatus including a heating board divided into a plurality of heating blocks, the heating blocks being arranged in a vertical direction in one line only. Thus, in order for the obviousness rejection over Ohno and Nied to be sustained, the Examiner must have demonstrated that one of ordinary skill in the art: (1) would have been motivated to combine the teachings of Ohno and Nied, and (2) having combined the teachings of Ohno and Nied, would have been further motivated to alter the heater of Nied to obtain a heating board divided into a plurality of heating blocks arranged in a vertical direction in one line only. Appellants submit that the record in this case is devoid of such a showing.

The Examiner asserts that it would have been obvious to modify the apparatus of Ohno to incorporate the dielectric heater 2 of Nied because such modification would have allowed differential heating of different areas of the film as suggested by Nied. *See* June 14, 2005 Final Rejection, paragraph 4, page 5. The apparatus of Ohno employs a heating board 9

to heat a pattern-bearing film F to be formed in a female mold 2 prior to injection molding to form a molded article. *See* column 3, line 45 to column 4, line 5. Nied, in contrast, discloses an apparatus for thermoforming an article from a polymer sheet. *See* column 1, lines 10 to 14. The apparatus of Nied addresses, in particular, the issue of forming articles having controlled wall thicknesses by conducting local control of temperature of a polymer sheet before thermoforming an article. *See* column 2, lines 33 to 50. There is no teaching or suggestion in either of the references that the issue of controlling wall thickness of thermoformed articles (addressed in Nied) is problematic in forming pattern-bearing films included in articles formed by injection molding (disclosed in Ohno). As is evident from, for example, FIG. 16 of Ohno, the thickness of an injection molded article including a pattern-bearing film is controlled largely by the injection molding process, and not the process by which the pattern-bearing film is provided in a mold. That is, Nied discloses temperature control for controlling wall thickness of an article, but there is no disclosure in either Ohno or Nied that controlling wall thickness is an issue in forming injection molded articles including pattern-bearing films. To combine Ohno and Nied, as suggested by the Examiner, would constitute introducing the complexity (and expense) of the dielectric heater of Nied to the apparatus of Ohno to address a problem identified only in the instant specification. *See, e.g.,* MPEP §2143 ("The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure") (citing *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991)).

Also, it is not possible to combine the apparatus of Ohno and the dielectric heater of Nied without considering whether such combination is mechanically possible. The Examiner asserts that such combination would be desirable to obtain "differential heating of different areas of the film as suggested by Nied." *See* June 14, 2005 Final Rejection, paragraph 4, page 5. However, it should be appreciated that Nied accomplishes differential heating through the

use of a dielectric heater 2 including a first electrode 18 provided on a first side of a polymer sheet 5 and second electrode 20 provided on a second side of the polymer sheet 5, at least the first electrode 18 including discrete conductive electrode segments 24. *See* column 4, lines 19 to 29; FIG. 2. The heating board 9 of the apparatus of Ohno heats the pattern-bearing film F when the film F is positioned on the female mold 2. *See* column 9, line 64 to column 10, line 5; FIG. 13. In order to conduct differential heating in the only manner disclosed in either Ohno or Nied, it would be necessary to provide an electrode on either side of the pattern-bearing film F in the apparatus of Ohno. This would greatly complicate the apparatus of Ohno, and further would make it impossible to apply a vacuum to the space between the pattern-bearing film F and the female mold 2 to draw the pattern-bearing film F into contact with an inner surface of the female mold 2 -- the second electrode would be in the way. *See*, e.g., MPEP 2143.01 ("If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification") (citing *In re Gordon*, 733 F.2d 900 (Fed. Cir. 1984)). The combination of Ohno and Nied proposed by the Examiner is not an operable one.

After making the combination of the apparatus of Ohno with the dielectric heater of Nied (which combination is flawed for the reasons discussed above), the Examiner asserts that it would have been obvious to modify the dielectric heater 2 of Nied to provide only a single line of discrete conductive electrode segments 24, or heating blocks, when "a corresponding profile of varying temperature zones is desired in the sheet." *See* June 14, 2005 Final Rejection, paragraph 4, page 5. As mentioned above and admitted by the Examiner, neither Ohno nor Nied discloses a heating board with heating blocks arranged in a vertical direction in one line only. In addition, neither Ohno nor Nied discloses a situation in which "a corresponding profile of varying temperature zones is desired in the sheet." The only teaching or suggestion of a configuration of a heating board with heating blocks arranged

in a vertical direction in one line only, or teaching or suggestion of a situation or rationale for employing such a configuration can be found in the instant specification. Moreover, the modification suggested by the Examiner, in which only a single vertical line of discrete conductive electrode segments 24 is included in the dielectric heater 2 of Nied, is contrary to the purpose of Nied. The dielectric heater 2 in the apparatus of Nied is designed to improve regional control of temperature on a polymer sheet 5. Scaling down the dielectric heater 2 of Nied to include only a single vertical line of discrete conductive electrode segments 24 only reduces that control. It would not be obvious to one of ordinary skill in the art to undermine the very purpose of the apparatus disclosed in Nied.

The Appellants discovered that when employing a heating board in an apparatus in which a pattern-bearing film is stretched over a female mold for heating, higher positions on the heating board tend to have higher temperatures than lower positions on the heating board, and, as a result, higher positions on the pattern-bearing film will have higher temperatures than lower positions. *See* instant specification, page 20, lines 29 to 33. The apparatus of claim 7, which includes a heating board divided into a plurality of heating blocks, the heating blocks being arranged in a vertical direction in one line only, prevents this potential non-uniformity of temperature distribution. *See* instant specification, page 20, line 36 to page 21, line 4. Ohno and Nied fail to identify this potential problem or identify solutions thereto.

Accordingly, claim 7 would not have been rendered obvious by Ohno in view of Nied.

C. Claim 8 Would Not Have Been Rendered Obvious By Ohno In View Of Nied and Chapman

Claim 8 recites "[t]he apparatus according to claim 7, wherein each of said blocks includes therein a heating wire and a temperature sensor for detecting the temperature of each block." For the reasons set forth in the preceding section, Ohno and Nied do not teach or

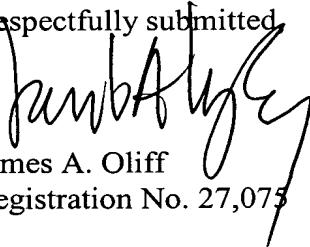
suggest each and every feature of the apparatus of claim 7. Chapman does not remedy the deficiencies of Ohno and Nied.

Chapman is cited by the Examiner for its alleged disclosure of an apparatus for thermoforming film including a heating unit that has a temperature sensor for monitoring heat imparted to the film and for adjusting a heater based on detected temperature. *See* June 14, 2005 Final Rejection, paragraph 5, page 6. However, Chapman, like Ohno and Nied, fails to teach or suggest an apparatus including a heating board divided into a plurality of heating blocks, the heating blocks being arranged in a vertical direction in one line only. As none of the cited references teaches or suggests an apparatus including a heating board divided into a plurality of heating blocks, the heating blocks being arranged in a vertical direction in one line only, no combination of the references can teach or suggest each and every limitation of claim 7.

Ohno, Nied and Chapman would not have rendered claim 7 obvious. Claim 8 depends from and includes every limitation of claim 7. Accordingly, claim 8 also would not have been rendered obvious by Ohno, Nied and Chapman.

VIII. CONCLUSION

For all of the reasons discussed above, it is respectfully submitted that the rejections are in error and that claims 7 and 8 are in condition for allowance. For all of the above reasons, Appellants respectfully request this Honorable Board to reverse the rejections of claims 7 and 8.

Respectfully submitted

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APPENDIX - CLAIMS APPENDIX

CLAIMS INVOLVED IN THE APPEAL:

7. An apparatus for forming a pattern onto an article during an injection molding thereof, comprising:

feed means that feeds a pattern-bearing film to a molding position where a male mold and a female mold are opposed;

a heating board formed in a single line only and that heats said pattern-bearing film so as to soften it, said heating board having a heating surface and being movable into and away from a space between said male mold and said female mold;

transfer means that transfers said pattern-bearing film to an internal surface of said female mold so as to contact said pattern-bearing film with said internal surface;

closing means that causes said male mold and said female mold with said pattern-bearing film therein to approach each other to form a closed molding cavity; and

a resin injecting device that injects a molten resin into said cavity to form a molded article to adhere said pattern-bearing film to the surface of said article;

wherein (1) said heating board is formed in a single line only and is divided into a plurality of heating blocks, each of said blocks independently controlling heat generated by the block and having a transverse width sufficient to cover at least most of the width of said pattern-bearing film,

(2) said heating blocks are arranged in a vertical direction in one line only so that one heating block is disposed adjacently above another heating block, and

(3) said pattern-bearing film is sent from an upper position to a lower position along the vertical direction in one line, the direction of the arrangement of the divided heating blocks and the direction of passage of said pattern-bearing film being identical.

8. The apparatus according to claim 7, wherein each of said blocks includes therein a heating wire and a temperature sensor for detecting the temperature of each block.